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NOTE

The Occurrence of *Adicrophleps hitchcocki* Flint (Trichoptera: Brachycentridae) in the Diet of Brook Trout, *Salvelinus fontinalis* Mitchell, in a Small Headwater Stream in Maryland

Analyses of trout diet provide information about water quality and the species and sex ratios of food items. Such studies also support evaluating ecological models of predator-prey relationships and identify taxa important to sustaining growth and reproduction for a particular population of trout. Investigations that span at least a year can provide seasonal information on species being consumed, and thus indicate emergence patterns of the insects on which the trout feed (Elliott. 1967. Journal of Applied Ecology 4: 59–71). Stomach samples of an alpine brook trout population in Wyoming showed that trout feed on the caddisfly, *Glossosoma verdona* Ross, at a minimum of two periods in its life cycle (Duffield et al. 1995. Journal of the Kansas Entomological Society 67: 277–282). The first occurs during the adult emergence and the second occurs when the female caddisflies return to the water to oviposit. Studying another Wyoming stream, Hubert and Rhoades (1989. Hydrobiologia 178: 225–231) showed that brook trout feed on a variety of aquatic organisms from July through September. This diet included the immatures of five families of Trichoptera, with the trout showing preference for Trichoptera larvae as well as beetle larvae. Analysis of the diet samples also showed that aquatic organisms were gradually replaced by terrestrial items as the seasons progressed.

Here we report that the caddisfly, *Adicrophleps hitchcocki* Flint, occurs in the diet of a natural population of brook trout, *Salvelinus fontinalis* Mitchell, in Clifford Branch, a small headwater stream in Frederick County, Maryland. Clifford Branch is a first/second order stream (39°30′N, 77°27′E) which runs southeast from the Catoctin Mountains originating in the Frederick Municipal Forest. It is approximately 1.5 miles long and joins Tuscarora Creek to empty into the Monocacy River. The watershed of Clifford Branch consists of a mixed hardwood forest. The streambed is gravel and small stones. Many of the rocks in the upper reaches are covered with *Fontinalis* sp., an aquatic moss.

Brook trout were caught using artificial flies at various times between 9:00 AM and 7:00 PM, between January 1993, and June 1994. Samples of stomach contents were obtained using a stomach pump as described by Duffield and Nelson (1993. Aquatic Insects 15: 141–148).

Stomach contents from 453 *S. fontinalis* collected at Clifford Branch contained a total of 9,666 items. The total samples obtained per month ranged from 0 (July) to 85 (April), with a mean of 38 (Table 1). The

Table 1. *Adicrophleps hitchcocki* in stomach samples of brook trout from Clifford Branch, Frederick Co., Maryland.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Larvae	22	96	37	3						2	5	19	184
Pharate male				1									1
female				4	22								26
Samples/month	29	60	64	85	44	39	0	23	31	17	34	27	453

number of items per sample ranged from a single specimen in 13 samples to 501 items in a single sample, with an average of 21.3 *Adicrophleps hitchcocki* represented 16% of all Trichoptera recovered and 2% of the total diet items. Only larvae and pharate adults were recovered. Of the 184 larval cases, approximately 25% were empty. A total of 27 pharate adults (26 ♀ and 1 ♂) were obtained. Twenty-six of the pharate adults were recovered in a short seasonal span, on April 24, 1994 or May 1, 1993.

Adicrophleps is a monotypic genus described by Flint (1965. Proceedings of the Entomological Society of Washington 67: 168–176). It is reported to be found in small cool streams in the central eastern North America (Wiggins. 1996. University of Toronto Press, Toronto, 1–457). Glime (1968. Castanea 33: 300–325) contributed much to our knowledge of this species. This diminutive species constructs cases out of pieces of aquatic moss. The small, green, four-sided, tapered cases are quite cryptic, blending into the *Fontinalis*-covered rocks.

This is the first report of *A. hitchcocki* in the diet of trout. *Adicrophleps hitchcocki* was one of the dominant caddisflies recovered in this study, namely 2% of all food items by number and 16% of all Trichoptera. About 87% of the *A. hitchcocki* were larvae, and most of these were consumed in their cases. Most cases recovered from stomach samples were intact, with only a few partially crushed or less than full size.

After the summer, larvae of *A. hitchcocki* were first recovered in the stomach samples in October. Larval representation steadily increased in the samples in the winter months with the peak occurring in February (96 specimens) followed by a gradual decrease. Wiggins (1996) indicated final-instar larvae pupate in May, and first-instar larvae start to appear in July.

While trout may actively forage for the cases, it is more likely that the cases are washed free from the substrate. Increases in the discharge during the winter and early spring months would facilitate this. The brook trout opportunistically feed on these food items in the water column as they pass by their feeding stations.

Tebo and Hassler (1963. Journal of the Elisha Mitchell Scientific Society 79: 44–53) reported the presence of immatures of a number of case-making genera of caddisflies in the diet of trout from streams in western North Carolina. Cased larvae of the genus *Brachycentrus* Curtis (Brachycentridae), were the most abundant insect taken in the bottom samples presumably because of their exposed position in the habitat making them vulnerable to being "grabbed" by foraging trout. This report established that brook trout consume cases made of plant material. *Adicrophleps* and *Brachycentrus* belong to the same family.

Adicrophleps hitchcocki pharate adults were present in stomach samples collected in late April and early May (Table 1), with female specimens predominating. Very few male pharate adults were recovered in stomach samples. The basis for this gender-based dietary selection is unknown. There are no reports suggesting a female-biased sex ratio for *A. hitchcocki*. Our data suggest that *A. hitchcocki* not only has a short emer-

gence period but has only one generation a year.

We assume that the brook trout were feeding on pharate adults as they were rising to the surface to undergo ecolosion. Teneral individuals were most likely intercepted before they could free themselves from the water surface and crawl onto an object out of the water. This obviously is a very vulnerable stage for caddisflies where predators may consume large numbers. Duffield et al. (1995) found the same to be true for the caddisfly, *Glossosoma verdona.*

Within its range, *A. hitchcocki* may actually be a relatively common species in small, cool and unpolluted streams. Good populations have been documented in other streams containing native brook trout populations in both Maryland and Virginia (Duffield 1995, unpublished observations). It is feasible that *A. hitchcocki* is an important dietary item for resident brook trout populations and may play an important role in maintaining their population densities.

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NOTE

Humbugs, Type Specimens, and the Identity of *Asaphocrita pineae* (Amsel 1962), New Combination (Gelechioidea: Coleophoridae: Blastobasinae)

The examination of primary types is an essential part of all taxonomic studies. Type specimens serve as a basis for the original description, the definition for named species, a standard for comparison of specimens of known or unknown identity, and a vehicle for a given name. While early authors (e.g., Linnaeus) did not use types in practice, their necessity subsequently was gradually recognized. Type specimens can be used to settle questions of ambiguity, such as cases of mixed species in the original series. In addition, type specimens may represent a source of data not recorded by the original describer.

Recently, I requested from Staatliches Museum für Naturkunde Karlsruhe, Germany, a loan of the holotype of *Holcocera pineae* Amsel 1962 (Zeitschrift fuer Angewandte Entomologie 49: 392–398) to complete work on a synopsis of the Neotropical Blastobasinae (Coleophoridae). Because museum policy at Karlsruhe restricts the loan of holotypes and allotypes, I was sent a "female" paratype (Fig. 1). Examination of this specimen revealed some very interesting findings—the specimen was a "humbug."

The term "humbug" is familiar to most entomology graduate students. It refers to specimens created by graduate students, usually teaching assistants, for the purpose of testing students on insect morphology and taxonomic identification. Body parts of specimens representing various taxonomic groups are stockpiled and later meticulously selected for the construction of a unique "humbug." These insectan models usually are so painstakingly assembled that they rival Shelley's Frankenstein monster.

The paratype from Karlsruhe was female, but it also was male. The specimen was not